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Descriptors-*CONCEPTUAL SCHEMES, *EARLY CHILDHOOD, *LANGUAGE DEVELOPMENT, LANGUAGE HANDICAPS, LANGUAGE USAGE, *LEARNING THEORIES, *LINGUISTICS, MODELS, TIME FACTORS (LEARNING), TRANSFORMATION THEORY (LANGUAGE)

Conceptual models of language learning and language use were made by a committee of school personnel interested in investigating learning differences in preschool language development, even though public school systems do not as yet include preschool classes. Normative information was collected from various research sources and classified. Discussions of model formation considered the relationship of language to cognitive development, the relationship of critical learning times to sensory and language development, linguistics, and the specification of listening behaviors crucial to language development. Linguistic investigations became a major focus. Since the sensory, psychomotor, affective and cognitive areas of human development affect language acquisition, these areas were included in the language analysis. A bibliography is included, and appendixes illustrate the models and show the classifications of the data. (MS)

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A Study of Language Development from Infancy to Age 5

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As public school systems have become increasingly concerned with educational programs for children of "pre-school" ages, such as those in Headstart classes and special-project nursery classes, interest has generalized to the area of language development. If there is to be a trend for pre-school education to come increasingly into the domain of the public school system, the rationale will be primarily developed around the benefits which accrue to children who have had the advantages of early training designed to facilitate the development of language and therefore of intellectual function. Much remains to be researched and written concerning the validity of this rationale, but the fact remains that public school nursery programs are already established, or are being planned, for children with handicapping conditions who would fall into the category of special education students. The renewed and widespread interest in early childhood education is one indication that pre-school education in the future may come to be thought of as indispensable to the regular public school program.

It is not possible to say if the early education trend is of such force that every school system ought to be engaged in the study of language development in order to learn more about the design of curriculum for young children. It is possible to say with certainty, however, that every school system presently has enrolled some children whose development is at a pre-school level and for whom the primary teacher wishes he had some clues about realistic expectations and the design of an individualized program to carry them out. It is now widely recognized that many children of traditional school age exhibit language development levels below their chronological age, and there is currently great national interest in finding better ways to work with them.

Development of the Montgomery County Project

The Project on Language Development grew out of a series of regular meetings of the Department of Supervision and Curriculum Development in which representatives of many disciplines evidenced interest in the relatively unknown quantity of early language development, and identified it as an area of primary importance to the school system. These representatives created the Committee on the Development of Language Prior to Age Six, and met weekly to consider the reports of the working committee (sub-committee) and further elaborate the definition and direction of the problem. One of the interesting outcomes of the year's work was the creation of a conceptual model of language-learning and language-use. This model not only helped to define the framework of future research, but also represented a unique organizing element in inter-disciplinary communication.

At the outset, three problems were seen as practical reasons for the work of the committee.

A. Many mentally retarded children of school-age may have mental ages of two or three years. Their language development is often correspondingly retarded and there is little evidence that traditional approaches in language work is of greatest benefit to them.

B. A majority of children in special programs exhibit language difficulties of one kind or another but normative information on early language development is inadequate to specify, in meaningful ways, the differences in language development.

C. Curriculum materials need to be developed in areas of language development about which there is presently little scientific knowledge.

It was known that very little real information about the acquisition of language existed and that research from many areas of child study would have to be gathered and somehow integrated into forms that would have eventual meaning for instructional programs. The varieties of terminology and ideas within the group led to the

formation of a conceptual model of language learning and language use into which all information could be fitted and discussed in terms common to the group. The models are reproduced here, Appendices A and B, to emphasize the comprehensive nature of the investigation. It should be noted that these are highly abstract in nature and provide the necessary broad base for synthesizing information. The models indicate that understanding of language acquisition requires consideration of sensory, psycho-motor, affective and cognitive areas of human development. Secondly, as language is learned, we can discuss it in terms of systems and processes among which are decoding, encoding and processing. Pertinent to these functions, however, is the base of learned language on which they rest. It will be seen later that this is a crucial point in evaluating children with language problems.

In constructing the model, the committee was influenced greatly by Myers and Dingman, (1) and the Illinois Test of Psycho-Linguistic Abilities. The efficacy of employing Bloom's Taxonomy was also shown. (3) The committee set forth the task of collecting normative information and classifying it according to the areas found in Appendix C. While there is a wealth of behavioral information about the five-year-old child, it was quickly found that very little of the information about younger children is sufficiently normed and classified so as to be readily fitted meaningfully into working charts of this type. Nevertheless, much information was gathered and sorted and a number of questions were formulated which helped to narrow the recommendations for continuation of the project. The questions were and are important to the project and are summarized below.

A. Of the available normative information about young children, much is related to non-language areas. These areas are important to the observation of total development, including language development, but features critical to the development of language are not clear cut. Which are essential for consideration?

B. Are the language development processes as described by Piaget and Vygotsky useful categories under which observable behaviors might be listed? Example as follows:

1. The Pre-Linguistic or Sensory-Motor Phase
2. The Representational Phase (establishes relationship with environment)
3. The Ego-Centric Phase (establishes relationship with self)
4. Internalized Language
5. Logical Thought

C. Is cognitive development "concept development?"

D. Should the development of thought be considered a parallel but different process from language development?

E. Will answering these questions be crucial to the success of the project?

The belief of the committee was that language development can be traced in terms of observable and hypothesized behaviors which can be classified into sensory, psychomotor, linguistic, affective and cognitive elements. In this way a body of normed behavior would be established against which most children could be compared and their language needs studied. Other recommendations were made concerning observations of normal and atypical children. Later, the quantified behaviors were to influence the writing of curriculum, with each special area determining patterns unique to itself. Considerable time was spent in locating centers of research and using their services, contacting experts in the field of language and reviewing their research, contacting those with unpublished research who were willing to share results, reviewing existing tests and evaluation schemes, and consulting with those who felt they had contributions to make. The reactions of people from all areas of the United States, representing many different disciplines, were strongly supportive of the project as an effort of genuine value.

The Task of Language Study

To describe comprehensively the process of language acquisition and usage would be one of the most significant events of our century since it would open wide the doors to the world of cybernetics as described by Wiener. Of course the project was not designed to pursue this desirable but unlikely goal. It is possible, however, to make an original and highly valuable contribution as the result of our less rigorous methods of observing how most children learn language, relating this body of information to the available research, borrowing from the linguist, psychologist and others, sets of terminological information which will allow us to discuss our findings and apply them.

It is difficult to shed our various "sets" in thinking about language in its developmental components because we are accustomed to working with the language development of school-age children who already have fully developed language systems. Such work would be better designated as "language refinement" or "providing sophistication in language" since the work primarily involves expanding an existing vocabulary, providing experience in transforming already learned syntactic structures, emphasizing abstract use of known language, translating the world of ideas into language, and relating language to new forms of expression, i.e., reading and writing. In discussing the early stages of language learning we are dealing with a puzzle which is always fragmentary, never complete, and we may find it necessary to squeeze into some vocabularies which are initially uncomfortable but become uniquely serviceable after they have been worn for awhile. A second aspect of the need for very carefully selected terminology is the value of preparing ourselves for the impact of other fields on the field of education. Can there be any doubt that linguistics and learning theory will increasingly hold our attention in the coming years? Will we be able to make good use of thought in these areas if we do not understand, or understand only superficially, the language in which formation is expressed?

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The first concern of the present research is in regard to children who may be termed "pre-linguistic." This means dealing with information from nearly all fields which study the human, translating ideas and facts into comprehensible material and synthesizing the results. A key to the handling of information about the child who has not yet completed the development of his basic language system is understanding that such information can be, and usually is, expressed in identical terminologies as that regarding the child who has developed language. In other words, the language with which we talk about language and its development is for the most part imprecise and ambiguous. We often use identical terms in discussing the language of the three-year-old and the adult, even though we are talking about two very different processes.

In public education our vocabulary for discussing language development is at the level of jargon and largely non-productive. We tell teachers that "language is developed through experience" and then express surprise that the experiences don't seem to lead anywhere. Is it necessary to understand that experiences are provided specifically to give the child the opportunity to build the perceptual backlog necessary to concept formation? If so, it may be that we need to find out how to provide these in a more efficient manner than by the shotgun approach in vogue today.

Linguistics

The usefulness of linguistics as a tool of investigation is being explored. Linguistics is not an end product as many educational publishers would have us believe, but it is an aid to the study of language, and has a useful and precise lexicon. "Linguistics is the scientific study of language. It is inductive, objective, tentative, and systematic; it is concerned with reportable facts, methods, and principles; it works by means of observations, hypotheses, experiments, postulates, and inferences; its products are descriptive verbal or algebraic statements about language." (3)

Linguistics assumes that language is in a continual process of change, that oral output is the key to language analysis, that the structure of language may be observed and quantified into a grammar, and that all languages are systematic and different from each other.

Misunderstandings about the use of linguistics are common because the field is very broad and several specialized areas are contained within it. Areas of study within the field of linguistics are phonology, morphology, syntax and semantics. A renewed interest in the usefulness of linguistics has been generated by the work of Chomsky (4), who has defined the English grammar for computer use. The result has been the definition of nearly all possible patterns in English.

John Carroll, (5) at Harvard, suggests that transformations are mastered by children in much the same way in which it is necessary to apply them in linguistic analyses of sentences. Nearly all lexical and grammatical phenomena in language represent concepts, which he defines as implicit representations of classes of experiences. Presumably concepts can be ordered in terms of difficulty and perhaps the number of attributes which define them and the complexity of their relationships. If the mentally retarded child has a communication problem perhaps it is because he has not been trained to use an appropriate sentence type for a given situation. In this regard, the problem of language learning may actually be a problem of storage. The recommendation was made that linguistic investigation become the main thrust of the language project because:

A. Linguistics is a structured, scientific method of quantifying observations of language output.

B. Linguistics is a method of inquiry which will complement observational studies being made in many areas of curriculum.

C. Conclusions from the study of early language can be directly related to higher age levels through linguistic interpretation.

Linguistics in the Study of Child Language

Cooper and Rosenstein (6) indicate that studies of the language of children have two major variables, first, the ways in which the information is obtained, and second, the type of analysis which is used on the information. In addition, there are two primary ways in which information can be obtained. The researcher may attempt to take a direct sample of the child's language by use of the tape recorder or selection of a writing sample. In each case the sample must be close to the optimal output of the child, a condition for which it is sometimes difficult to control. The researcher may also choose to infer linguistic information on the basis of control of the behavior of the child through controlled variables. In both methods, the sample taken must be representative of the child's maximal output. In this regard, it has been observed that young children appear to give their most highly developed language when in interaction with adults, not in peer to peer communication.

The bulk of the studies of child language have used statistical measures in the analysis of data, primarily the counting of certain features of the sample, and these may be thought of as non-linguistic analyses. Where linguistic observation of data is used, the researcher attempts to specify the operational grammar of the sample, primarily through analysis of structure.

One of the most useful concepts to come out of the body of research which may be called 'linguistic' is that the language development of children is not a purely imitative process but is a rapid and highly complex operation in which the child abstracts patterns of language from his environment, internalizes them, tests them, combines them with other patterns already learned, and uses them to generate an endless variety of possible utterances.

Linguistic Development in Children

Compared to other areas of development, the child's growth in grammatical competence is very rapid. Grammatical speech begins at about 1.5 years of age and is virtually complete by 3.5 or 4 years. Thus, a basis for the rich and intricate competence of adult grammar, a system that includes the simple phrase-structure grammar, must emerge in the short span of 24 to 30 months.

Unlike the traditional belief that child language was an attempt to abbreviate adult language, recent studies lead us to conclude that the child is using a simple grammar, the output of which is generic speech. It is a result, not a process, and reflects more than a limited memory. In various studies it has been shown that the earliest word combinations are not random. They are patterned and therefore are correctly called sentences. There are always several different patterns in early child speech. They usually consist of words selected from two primary grammatical classes, taken in fixed order. The most common pattern is the manipulation of words which fall into pivot and open classes. McNeil (7) believes that this demonstrates the child's ability to organize vocabulary into classes.

Since children's sentences have some form, pivot word followed by open word, we can assume that neither memory nor imitation are acceptable as explanations because of the number of words and the unlikely combinations which do not occur in adult speech. It appears that the child intuitively groups words; there is an expectation that in order for the meaning of two words to interact, they must belong to the same sentence constituent. Some observers have concluded that the general conception of constituent structure is a part of the child's basic capacity to acquire knowledge.

Linguistic studies are adding support to the growing opinion that THE CAPACITY TO ACQUIRE LANGUAGE MAY BE TRANSITORY: IT MAY REACH A PEAK AT AGE 2 TO 4 AND DECLINE THEREAFTER.

IT MAY EVEN DISAPPEAR ALTOGETHER AS A SPECIAL CAPACITY WITH THE BEGINNING OF ADOLESCENCE. There does seem to be a cut-off at puberty in the ability to acquire a second language. A second language learned before that time is usually acquired with relative ease and the result can be native fluency. A second language learned after this time does not usually result in such fluency. The implication for those working with language handicapped children is obvious.

Shortcomings of Linguistic Technique

We are well aware that the development of language directly involves psychomotor, affective, cognitive and linguistic areas. One of the problems in developing scales for the assessment of young children is to factor out the relationships of motor behavior to language behavior. It is well known the "good" motor responses (movement, body concept, manual dexterity) are highly correlated with language development. The degree to which, and more importantly, the way in which this development subserves the development of language is unknown. Entire schools of approach have been developed on the management of movement and integrated patterns of motor behavior. It would appear that other aspects of language development such as critical timing, auditory stimulation and exposure to speech models have been ignored.

The project on language development began as a comprehensive effort to investigate major domains on which language learning depends. It is not surprising, however, that a major focus (linguistic investigations) developed since not enough is known to bring the overall frameword to the desired specificity for program development. A secondary thrust in the future of the project will be an attempt to relate auditory abilities to what is learned about language output. Because of lack of research this will be less precise than linguistic observation but it is felt that the attempt, at least, is essential to the design of effective classroom programs. Some of the major concerns about which we want to become more aware are:

A. The relationship of language to cognitive development.

B. The relationship of critical times to sensory and language development.

C. The specification of listening behaviors which are now thought to be crucial in language development.

D. Differential recommendations for needs of various young populations.

Appendix A:

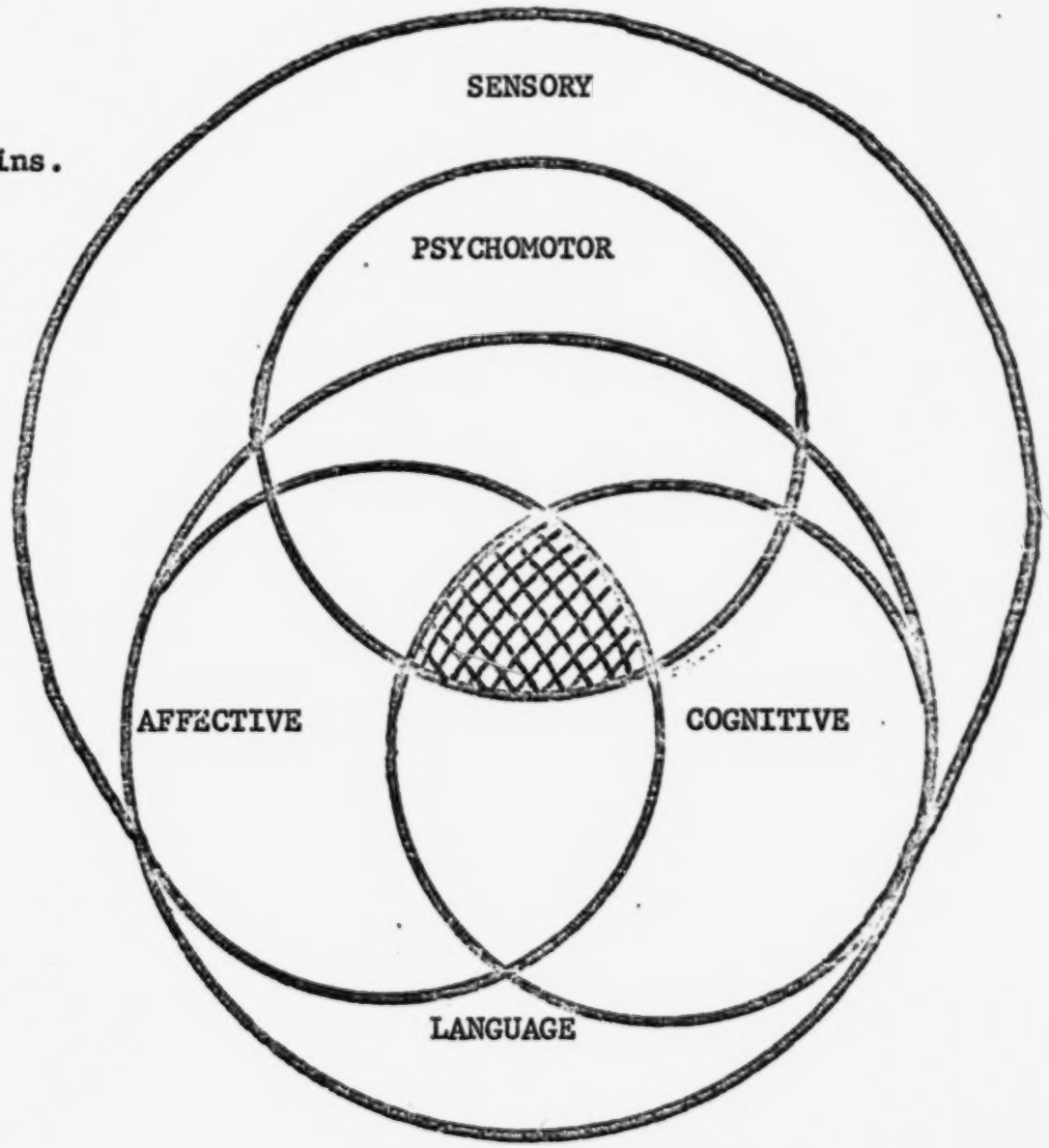
LANGUAGE LEARNING

1. Circles indicate domains.

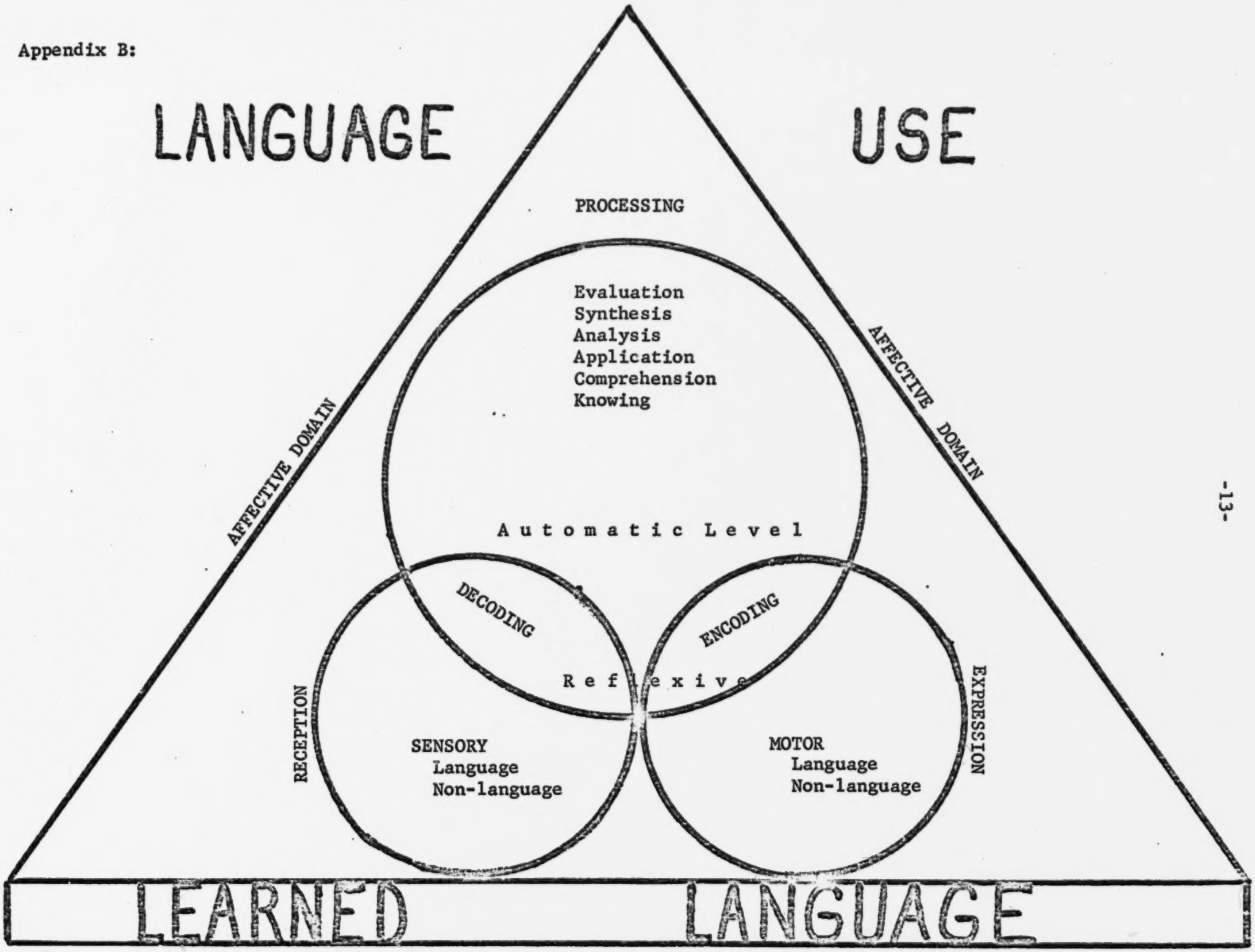
2. Overlaps involve the individual's learning of language.

3. The individual's learning of language is most adequately described in the overlays of all four circles.

4. Relative size of circles or overlaps is not meaningful.



Appendix B:


LANGUAGE USE
PROCESSING
Evaluation
Synthesis
Analysis
Application
Comprehension
Knowing
Automatic Level
AFFECTIVE DOMAIN
AFFECTIVE DOMAIN
DECODING
ENCODING
Reflexive
RECEPTION
EXPRESSION
SENSORY
Language
Non-language
MOTOR
Language
Non-language
LEARNED LANGUAGE

Appendix C: Evident or Hypothesized Development

Age Equivalent	Normed Behavior	Sensory-Psychomotor	Affective	Sub-Cognitive
1 Month	Spontaneous Activity	Receptive and Motor Patterning	Awareness of Physical Self	Storage of Sensory-Motor Impression
	1. Tonic neck reflex	1. Channelization of vision toward hand and orientation in space through positioning	1. Awareness of hand	1. Storage of impressions of hand and objects in space
	2. Reflex grasp	2. Patterning of flexion movements of fingers and thumb	2. Awareness of parts of hand	2. Storage of tactile-kinesthetic impressions of parts of hand
	3. Symmetric windmill movements	3. Initial patterning of gross motion	3. Awareness of arms, legs, head, and trunk	3. Storage of tactile-kinesthetic impressions of body parts
	4. Vocalizations a. Crying b. Small, throaty noises	4. Initial patterning of control of vocalization	4. Awareness of ability to produce sound	4. Storage of impressions related to vocalization and sound of own voice
	5. Lifting of chin while lying on abdomen	5. Momentary anti-gravity head control and patterning of anti-gravity response	5. Awareness of gravity forces on head and of anti-gravity response patterns	5. Storage of gravity impressions and anti-gravity response patterns
	6. Crying in response to stimulus	6&7. Vocal response to stimuli	6&7. Willingness to receive stimuli	6&7. Storage of sensory impressions and response patterns
	7. Quieting in response to motion			

Appendix D: Suggested Readings

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